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32

MEMORANDUM

SUBJ Evaluation of the status of **Bayer Corporation – Bushy Park Plant** under the RCRAInfo
Corrective Action Environmental Indicator Event Code CA725
EPA ID Number SCD 048 373 468

FROM Crystal D Rippy, Engineering Associate *CR*
Operations Engineering Section
Division of Waste Management
Bureau of Land and Waste Management

THRU. Michelle D Sherritt, Manager *MDS*
Operations Engineering Section
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John T Litton, P E., Director *JTL*
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TO Bayer Corporation – Bushy Park Plant Project File
EPA ID # SCD 048 373 468
Central File Room # 051398

DATE September 5, 2001

I. PURPOSE OF MEMO

This memo is written to formalize an evaluation of the status of Bayer Corporation – Bushy Park Plant (Bayer), located in Berkeley, South Carolina, in relation to the *Current Human Exposures Under Control* (CA725) corrective action event code defined in the Resource Conservation and Recovery Act Information System (RCRAInfo). An evaluation of Bayer's status in relation to the *Migration of Contaminated Groundwater Under Control* (CA750) corrective action event code will be finalized under separate cover.

Concurrence by the Operations Engineering Section Manager and the Division of Waste Management Director is required prior to entering this event code into RCRAInfo. Your concurrence with the interpretation provided in the following paragraphs and the subsequent recommendation is satisfied by dating and signing at the appropriate location within Attachment 1.

II. HISTORY OF ENVIRONMENTAL INDICATOR EVALUATIONS AT THE FACILITY AND REFERENCE DOCUMENTS

This is the second evaluation for Bayer with regard to the CA725 corrective action event code. The first evaluation of Bayer's status with regard to both the CA725 and CA750 corrective action event codes was completed July 17, 1998 by EPA Region 4. Based on the information available at the time of the first

determination, a status code of 'IN' – 'more information needed' was entered for CA725 and a status code of 'NO' – 'facility does not meet definition' was entered for CA750

III. FACILITY SUMMARY

Bayer Corporation - Bushy Park Plant is located in Goose Creek, Berkeley County, South Carolina, east of the U S Naval Reservation and between the Back and Cooper Rivers which border the facility's western and eastern boundaries, respectively. Bayer includes several divisions which manufacture dyestuff, dyestuff intermediates, pigments, organic chemicals, organic rubber chemicals, and synthetic fibers.

Bayer has a hazardous waste management permit for the storage of hazardous waste in one (1) storage facility (the Hazardous Waste Storage Area located in the B12-2 Finished Goods Warehouse), the post closure care/corrective action of two (2) closed surface impoundments (the former holding pond and the former equalization pond), and the identification / corrective action of solid waste management units (SWMUs) and areas of concern (AOCs). A brief description of each unit follows:

The Hazardous Waste Storage Area is located in the west end of the B12-2 Finished Goods Warehouse and has a maximum capacity of 47,520 gallons. Types of waste which may be stored in the container storage area include waste ketone oils, waste filter bags, waste solvents, sump trench sludges, waste paint solids, and additional waste not routinely generated. Waste codes associated with these wastes include D001 (ignitable wastes), D021 (chlorobenzene), D022 (chloroform), D035 (methyl ethyl ketone), F001 and F002 (spent halogenated solvents), F003 and F005 (spent non-halogenated solvents), and P- and U-listed waste (discarded commercial chemical products, off-specification material, container residues, and spill residues).

The closed surface impoundments consists of one (1) former equalization pond and one (1) former holding pond. These units had a maximum combined capacity of 7,800,000 gallons per day and received corrosive (D002) wastewater. The former Holding Pond and the former Equalization Pond were closed in accordance with the approved closure plans by April 12, 1988 and by May 4, 1989, respectively.

To date, one-hundred (100) SWMUs and seven (7) AOCs have been identified at Bayer. A complete listing of these units and the required action (i.e. Confirmatory Sampling, RCRA Facility Investigation, etc.) can be found in Bayer's draft renewal Hazardous Waste Permit public noticed August 9, 2001.

IV. CONCLUSION FOR CA725

Name and I.D. No.	Location (City or Town)	Date of Latest EI Memo	CA 725 Decision
Bayer Corporation – Bushy Park Plant SCD 048 373 468	Goose Creek, SC	September 5, 2001	“YE”

V. SUMMARY OF FOLLOW-UP ACTIONS

The *Current Human Exposure Under Control* EI determination will be updated as necessary upon the discovery of new or contrary information.

Memo to Bayer Project File

September 5, 2001

Page 3 of 3

Attachment 1 CA725 Current Human Exposures Under Control

cc Bobbi Coleman, Division of Hydrogeology
 Wayne Fanning, Trident District EQC Office
 Syed Ahmed, RCRA Programs Branch, EPA Region 4

**Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)**

Interim Final 2/5/99

**ATTACHMENT I
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRAInfo Code (CA725)
Current Human Exposures Under Control**

Facility Name: Bayer Corporation – Bushy Park Plant
Facility Address 1530 Bushy Park Road, Goose Creek, SC 29445
Facility EPA ID #: SCD 048 373 468

- 1 Has all available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

 ✓ If yes - check here and continue with #2 below,
 If no - re-evaluate existing data, or
 If data are not available skip to #6 and enter "IN" (more information needed) status code

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA. The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRAInfo national database ONLY as long as they remain true (i.e., RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

Interim Final 2/5/99

- 2 Are groundwater, soil, surface water, sediments or air **media** known or reasonably suspected to be "contaminated"¹ above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?²

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	√			Arsenic**, benzene, chlorobenzene > MCL around regulated units
Air (indoors) ²		√		Known plumes are not located below occupied buildings
Surface Soil (e g , <2 ft)	√			Releases from SWMUs / metals, VOCs, BNAs
Surface Water	√			Suspected release to wetlands (Well 99 (W-99) data) / benzene, chlorobenzene, arsenic
Sediment	√			Suspected release to wetlands (W-99 data) / benzene, chlorobenzene, arsenic
Subsurface Soil (e g , >2 ft)	√			Releases from SWMUs / metals, VOCs, BNAs
Air (outdoors)	√			SWMU 19 Drum Wash Drain / VOCs (suspected)

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded

√_____ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation

_____ If unknown (for any media) - skip to #6 and enter "IN" status code

¹ 'Contamination' and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range)

² Recent evidence (from the Colorado Dept of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

Interim Final 2/5/99

Rationale and Reference(s)

- 4th Quarter / Annual 2000 RCRA Post-Closure Care Groundwater Monitoring Reports, March 5, 2000
- SP-2 Screening Report and COC Development 3-19-01
- CS Work Plan, 8-16-00
- Description of Current Conditions / SWMU Status Report and SWMU Assessment Report (DOCC/SSR and SAR), 8-5-99
- Soil Vapor Survey at the C-9 Block SWMUs #18 and #19, 8-30-94
- Interim Report of Groundwater Quality at the Drum Wash Area SWMUs #18 and #19 7-21-93

** a portion of arsenic contamination may be actually naturally occurring

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

Interim Final 2/5/99

- 3 Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table Potential Human Receptors (Under Current Conditions)							
"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food³
Groundwater	No	No	No	No	No	No	No
Air (indoors)							
Soil (surface, e.g., <2 ft)	No	No*	No	No*	No**	No	No
Surface Water	No	No	No	No	No	Yes***	Yes***
Sediment	No	No	No	No	No	Yes***	Yes***
Soil (subsurface, e.g., >2 ft)	No	No*	No	No*	No	No	No
Air (outdoors)	No	Yes [#]	No	Yes [#]	No	No	No

Instructions for Summary Exposure Pathway Evaluation Table

- 1 For Media which are not "contaminated" as identified in #2, please strike-out specific Media, including Human Receptors' spaces or enter "N/C" for not contaminated
- 2 Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway)

Note In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have assigned spaces in the above table While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways)

³ Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

Interim Final 2/5/99

- ✓ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation
- If unknown (for any "Contaminated Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s)

- * worker / contractor training
- ** fences / natural barriers prevent access to site
- *** W-99 data indicates possible discharge of groundwater exceeding MCLs into marsh however, exposures not expected to be significant due to dilution (see next page)
- # SWMU 19 -- Drum Wash Drain

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

Interim Final 2/5/99

- 4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"*** (i.e., potentially "unacceptable" because exposures can be reasonably expected to be 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"), or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

 √ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant"

 If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant"

 If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s)

W-99 data indicates possible discharge of groundwater exceeding MCLs into tidal marsh. Although the river is used for recreation purposes and there is fishing off of a nearby pier, exposures are not expected to be significant because of dilution (tidal). During low tide, direct exposures are not expected because marsh is extremely difficult to access.

With regard to air emissions, concerns are limited to one SWMU and worker presence in that area is limited.

4 If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

Interim Final 2/5/99

5 Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

- _____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e g , a site-specific Human Health Risk Assessment)
- _____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure
- _____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s)

SKIPPED (AS PER # 4)

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

Interim Final 2/5/99

- 6 Check the appropriate RCRAInfo status codes for the Current Human Exposures Under Control EI event code (CA725) and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility)

 √ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the **Bayer Corporation - Bushy Park Plant** facility, EPA ID #**SCD 048 373 468**, located in **Berkeley County** under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

 NO - "Current Human Exposures" are NOT "Under Control."

 IN - More information is needed to make a determination.

Completed by Crystal D. Rippy Date 9-5-01
Crystal D. Rippy, Engineering Associate
Operations Engineering Section
Bureau of Land and Waste Management

Supervisor Michelle D. Sherritt Date 9-5-01⁵
Michelle D. Sherritt, Manager
Operations Engineering Section
Bureau of Land and Waste Management

Locations where References may be found

SCDHEC
Bureau of Land and Waste Management
8901 Farrow Rd, Suite 109
Columbia, SC 29203

USEPA Region 4
RCRA Programs Branch
Waste Management Division
61 Forsyth Street
Atlanta, GA 30303

Contact telephone and e-mail numbers

Crystal D. Rippy
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FINAL NOTE. THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.